

CMF-iteMS: An automatic threshold selection for detection of copy-move forgery

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ABSTRACT

Taking into consideration that the prior CMF detection methods rely on several fixed threshold values in the filtering process, we propose an efficient CMF detection method with an automatic threshold selection, named as CMF-iteMS. The CMF-iteMS recommends a PatchMatch-based CMF detection method that adapts Fourier-Mellin Transform (FMT) as the feature extraction technique while a new automatic threshold selection based on iterative means of regions size (iteMS) procedure is introduced to have flexibility in changing the threshold value for various characteristics (quality, sizes, and attacks) in each input image. To ensure the reliability of the proposed CMF-iteMS, the method is compared with four state-of-the-art CMF detection methods based on Scale Invariant Feature Transform (SIFT), patch matching, multi-scale analysis and symmetry techniques using three available datasets that cover the variety of characteristics in CMF images. The results show that the F-score of the CMF-iteMS outperformed existing CMF detection methods by exceeding an average of 90% F-score values for image-level evaluation and 82% of F-score value for pixel-level evaluation for all datasets in original size. As special attention is given to the image resizing attack, the method is able to maintain the highest performance even if the images in the datasets are resized to 0.25 parameter.

KEYWORDS:

Copy-move forgery; Image forensics; Automatic threshold; Thresholding